



## Continuous Level Probe

potentometric measuring technique



measuring  
•  
monitoring  
•  
analysing

LNP



(When using  
LZE-hygienic  
installation system)



Weld-in sleeves LZE

- Suited for viscous, pasty very sticky media
- Stem length: 200-2000 mm
- Accuracy:  
±1 % of stem length
- $p_{\max}$ : 10 bar  
 $t_{\max}$ : 120 °C (short-time 150 °C)
- Process connection: G 1, 1 NPT hygienic mounting (EHEDG) with installation system LZE
- Food compatible materials stainless steel and PEEK
- Analogue output: 4-20 mA
- 8-digit LED-chain trend display
- 7-point linearity function for volume calibration



Level

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### Description

The KOBOLD level probes LNP serve for continuous level measurement of liquids with negligible conductivity. Levels in vessels containing viscous, pasty or very sticky media can be measured accurately with this new potentiometric method of measurement. It is most suitable for use in small vessels and for measuring fill heights greater than 200 mm.

The probe consists of a head mounted transmitter: this means that 4 - 20 mA analogue signal that is electrically isolated from the supply voltage is available.

The probe can be mounted from the top or bottom. The output signal is automatically output positionally accurate. Single stem probes can be used in metallic vessels where the tank wall is parallel to the stem.

The devices with the KOBOLD weld-in sleeve LZE form a hygienic measuring point which is cavity free and is ideally suited for CIP/SIP cleaning.

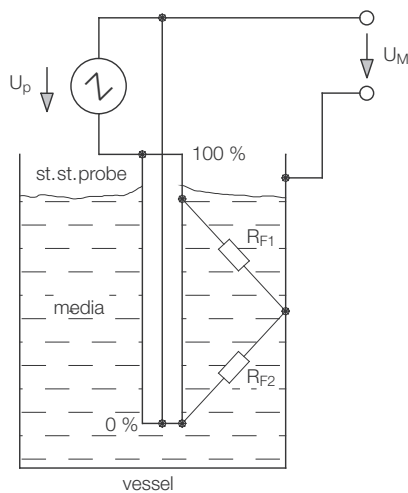
### The Measuring Technique

A defined potentiometer in the form of a stem is immersed in the medium. Thus a measuring bridge is created to the side of the tank or to the ground stem. The resistance of the measuring bridge changes in proportion to the level.

In opposition with the classic potentiometer, the contact with the liquid is not at a certain point, but along the entire length of the immersed probe. See the equivalent circuit diagram for the measuring technique.

In the electrical equivalent circuit diagram the liquid is represented by two equivalent resistors  $R_{F1}$  and  $R_{F2}$  of equal size. They divide the measuring signal exactly by two – an effect which makes it mathematically easy to correct.

### Equivalent Circuit Diagram for Measuring Technique



### Applications

Continuous level measurement in

- Viscous media
- Pasty media
- Very sticky media
- Media with low conductivity

### Technical Details

Measuring principle: potentiometric (ratio measurement)  
 Accuracy:  $\leq 1\%$  of stem length  
 Linearity:  $\leq 1\%$  (by parallel tank wall)  
 Repeatability:  $\leq 0.1\%$   
 Medium temperature:  $-10 \dots +120^\circ\text{C}$ , 30 min. to  $150^\circ\text{C}$   
 Ambient temperature:  $0 \dots 70^\circ\text{C}$   
 Max. pressure: 10 bar  
 Material:

- Head, screwed gland: stainless steel 1.4404
  - Isolating body: PEEK
  - Screw neck: stainless steel 1.4404
  - Stems: stainless steel 1.4404
- Stem lengths: 200, 300, 400, 500, 600, 700, 800 mm, 1000, 1500, 2000 mm (special lengths max. 2000 mm)

Process connection: 1 NPT  
 G 1  
 hygienic weld-in sleeves  
 LZE, LZE-NR

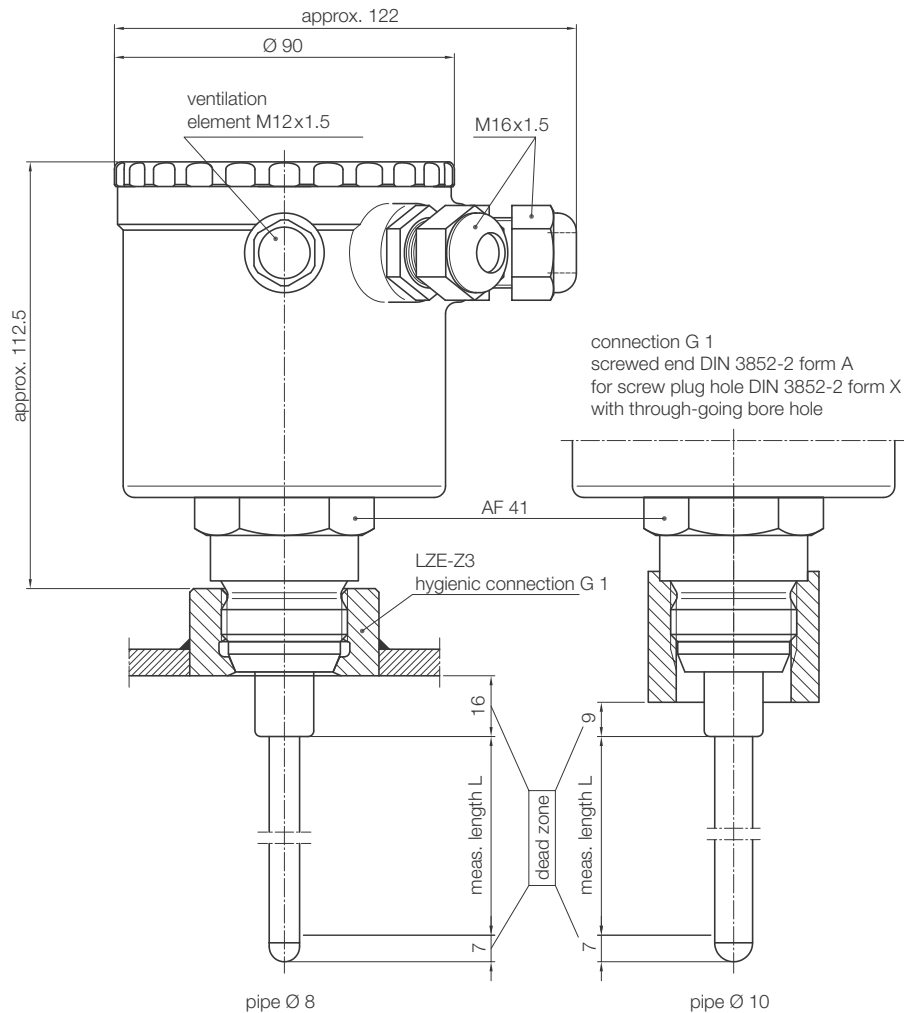
Electrical connection: 2 x cable gland M16x1.5  
 spring-loaded terminal: 4-pole  
 optional M12x1 connector

Trend indication: 8-digit LED for indicating the level within the scaled measuring range (resolution 12.5%)  
 signalling of the over and under range by flashing of the upper or lower LED

Setting:  
 • Zero point (4 mA): 0-25% of stem length  
 • F. s.value (20 mA): 75-100% of stem length  
 Linearity: 7-point volume calibration with equidistant calibration points (switched on/off)

Output: 4-20 mA  
 Load: max. 500  $\Omega$   
 Replacement signal: 2.4 mA  
 Power supply:  $18 \dots 36 V_{DC}$ , max. 120 mA  
 Minimum conductivity:  $1 \mu\text{S/cm}$   
 Protection: IP 67  
 Weight:  $> 1.6 \text{ kg}$

**Dimensions**



Level

**Order Details** (Example: LNP-G25 TP1 02)

| Model | Process connection       | Description<br>Electrical connection                    | Stem length  |
|-------|--------------------------|---|--|
| LNP-  | G25 = G 1<br>N25 = 1 NPT | TP1 = cable gland M16x1.5<br>TM1 = M12x1 plug connector | <p>02 = 200 mm (Ø 8 mm)<br/>                     03 = 300 mm (Ø 8 mm)<br/>                     04 = 400 mm (Ø 8 mm)<br/>                     05 = 500 mm (Ø 8 mm)<br/>                     06 = 600 mm (Ø 10 mm)<br/>                     07 = 700 mm (Ø 10 mm)<br/>                     08 = 800 mm (Ø 10 mm)<br/>                     10 = 1000 mm (Ø 10 mm)<br/>                     15 = 1500 mm (Ø 10 mm)<br/>                     20 = 2000 mm (Ø 10 mm)</p> <p>special lengths on request</p> |